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ABSTRACT

An ongoing research project, Dimensions of Classroom Instruction (DCI) is described. The primary data source is a study of reading in nine second-grade classrooms using such observation techniques as categorical observation, ethnographic observation, and videotaping. Three major objectives for the project are stated: 1) developing methods of refining information from sources such as ethnography, videotaped records, and interviews; 2) comparing information from the perspectives used in the reading group study and other sources available to the project; and 3) examining the relationships between the content of reading instruction, method of instruction, and individual students' abilities and perceptions. (JD)

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Dimensions of Classroom Instruction: A Programmatic Approach to the Description of the Classroom Environment

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Research and Development Center
for Teacher Education

The University of Texas at Austin

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Abstract

The Dimensions of Classroom Instruction project plans to study the classroom environment by examining it from a number of different perspectives, with special emphasis on instructional content. The primary data source is a study of reading in nine second-grade classrooms using several different observation techniques such as categorical observation, ethnographic observation, and videotaping. Through collaboration with other Center projects, the project also has access to several reading studies with different orientations.

The focus of the project is realized in three objectives. The first objective is concerned with developing methods of refining information from sources such as ethnography, videotaped records, and interviews. This will not only provide the information used in the other objectives, but can guide other researchers using these same techniques. The second objective is concerned with comparing the information from the perspectives used in the reading group study and other sources available to the project. The activities in the pursuit of this objective will allow the project to assess the relative validity of the information from the different observation systems used, which will serve the further purpose of verifying our conclusions about the classroom environment. The final objective is to examine the relationships between the content of reading instruction, the method of instruction, and individual students' abilities and perceptions. By using procedures similar to those used in the second objective, the project can make conclusions about the effectiveness of differing methods of reading instruction.

Dimensions of Classroom Instruction:
A Programmatic Approach to the Description
of the Classroom Environment

R. O. Clements, Project Director

The Dimensions of Classroom Instruction project (DCI) has as its primary goal the understanding of the classroom environment. Of course, this project does not stand alone in this ambitious line of inquiry. A great many researchers have engaged in what is called either "teacher effectiveness" or "process-product" research (see Medley, 1977; Rosenshine, 1971, for reviews). Many other researchers have begun using ethnography in the classroom (Tikunoff, Berliner, & Rist, 1975). While progress has been made toward understanding the relationship between teaching and learning, it has been slow. Most of the findings from teacher effectiveness research relate to classroom organization and management variables (Good, 1979; Anderson, Evertson, & Brophy, 1979) without relating to any specific content. In research using ethnography as an observation technique, relating the observations to student outcomes has proved difficult (Borich, 1979).

In past research, DCI (formerly the Evaluation of Teaching program) has found, through the study of observation systems, that observation methods have inherent problems (Clements, Malitz, & Zimmerer, 1979) that cannot be corrected in any reasonable way and, further, that any single system so biases the observers' outlook that even when two systems have similar categories, observers using different systems do not always agree. Through work with generalizability, DCI has also found that while most systems seem to be stable for a teacher on a single

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occasion across coders, the systems are not stable across occasions, even when the same subject matter is being taught. This suggests that perhaps focusing on units of behavior which are isolated from the context of surrounding behaviors and classroom environment may not produce meaningful results. Perhaps there are definable teaching behaviors or tasks which are necessary for a teacher to produce learning and the more microbehaviors and characteristics studied up to now are idiosyncratically part of these teaching tasks.

DCI has designed a research study and collected the data with these problems in mind. A comparative approach was used so that information from a number of perspectives could be included. This should help solve the problems of unreliability, bias, and restricted information because more than one technique of observation has been used. The information gathered will be compared for agreement, disagreement, and uniqueness. To attempt to define teaching tasks, DCI's library of classroom videotapes will be utilized so that the same class can be studied from many perspectives.

In designing its research study, DCI decided to focus on reading as a content area for three basic reasons. First, by focusing on a single subject/content area the variation in teacher behavior due to the different methods necessary for different subject matters could be reduced or eliminated. Second, this will allow the project to concentrate on the content part of teacher behavior, that is, the teacher tasks that are related to methods of teaching reading (e.g., the whole word method versus the phonics method). The study of instructional content has been largely neglected in past

teacher effectiveness research but it is quite possible that the truly predictive teacher behaviors will be those that are related to the teaching of a particular subject matter. The third reason is that there are data available from three other studies of reading in the Research and Development Center for Teacher Education. Since these studies were focused on different aspects of instruction and used different research methodologies, DCI will have the opportunity through collaboration with other projects at the Center to greatly expand its own data base on reading instruction.

Before describing the specific objectives of this project it would be useful to briefly describe the reading study. Reading instruction was studied in nine second grade classrooms from three different schools. Each classroom had two or three reading groups based on student ability. The classes were observed ten times each over the course of the school year. At each observation at least two observers were present, one ethnographer who was trained to attend to instructional and affective variables in the context of all other aspects of the classroom and one observer trained in the Stanford Research Institute (SRI) and Classroom Observation Scales (COS) observation systems which categorized behaviors involving the teacher. In addition, four sessions of each class were recorded on videotape. The student data collected included pre-post achievement data, pre-post self-esteem data, sociogram information, end-of-year interviews, and teacher ratings. Special teacher data collected included two interviews, ethnographer ratings, and pupil ratings. With this data, the data from other Center reading studies, and an extensive literature review, DCI will be able to carry out the objectives described below.

Objectives

Objective 1: Expanding the Knowledge on Content Analysis for Non-categorical Observation

Problem. The evolution of observation systems and the emergence of ethnographic methodology make it clear that most researchers feel that quantitative description alone of classroom processes is inadequate at this juncture of our understanding. The high cost of collecting classroom data and the variety and complexity of events that occur during teaching make it imperative that as much information as possible be collected with as much detail as possible. Videotaping instruction and writing narrative descriptions of classrooms promise to provide a richer degree of detail than any other technique now available. That richness of detail, however, compounds the problem of extracting usable information from the data once it has been collected.

Contributions. Much of the prior work of the Evaluation of Teaching program at the Center (the forerunner of DCI) concentrated on studying the reliability and validity of various observation systems. This experience will be invaluable in developing methods to extract the information from the various observation techniques used in the second grade reading study. The Center did extensive videotape work in classrooms during the period of 1965-1971 and the DCI project has renewed this activity during the past two years. DCI has also collected ethnographic information for the past year. By applying our previous work on observation system characteristics to videotapes and ethnography we intend to produce some workable coding schemes for videotapes and ethnography.

Questions to be addressed. As the first step toward the objective of extracting data from videotapes, it will be necessary to specify the technical arrangements and other conditions which biased the way videotaping was conducted in classrooms. Then the information recorded by the cameras can be correctly interpreted. The ethnographic reports and teacher interviews will be invaluable in this undertaking.

A primary question in examining ethnographic data is one of reliability. This question will be addressed by comparing descriptions of classrooms made on the scene with ethnographic descriptions of videotapes of the same classrooms by the same and by different ethnographers. Another critical question is how to categorize aspects of behavior described in the ethnographic reports. This can be approached by using the videotaped sessions to document events described by the narratives.

A final question is how to take advantage of the unique properties of videotapes and ethnographic reports--that events can be studied repeatedly from different perspectives--to do microanalyses of the events transpiring during reading instruction.

Procedures for Objective 1: Expanding the Knowledge on Content Analysis for Noncategorical Observation

Scientific work. This objective deals with a relatively unexplored area. It will involve examining and applying the techniques used in educational research and other disciplines to analyze noncategorical behaviors. These include such nonverbal behaviors as facial expression, body language, and social distance. The objective will also require the identification of extended sequences of behavior in the videotapes and narratives such as might occur between a teacher and one or more

of the members of a reading group. This would include such things as the way the teacher prompts the students and the way students try to distract the teacher from the task.

Method for accomplishment. This objective will require a careful study of the ethnographic narratives, videotapes, and coding collected during the second grade reading study. Development of analytic techniques for ethnographic material will be carried out in the initial phases by the ethnographers themselves, who will go through their own narratives for emergent categories, time frames, and consistent (or inconsistent) strings of teacher-student interactions within the several contexts dictated by Objective 3.

Accomplishing this objective will also require consultation with other researchers in the fields of nonverbal behavior and sequential analysis as well as those who have developed online data analysis tools and software.

Related research. This is a new research area for the DCI project, so part of the first year's work will be identifying the relevant research.

Plans for data acquisition, instrumentation, and analysis. All of the data will have been collected by the end of FY '79. Various coding schemes and methods of describing the information in the records will be tried. It is anticipated that multiple codings of the same videotapes using the computer-based Teaching Process Laboratory at the Center will be one approach. Descriptive categorical codings using more than one ethnographer will also be tried. The products planned for FY '80 are a report describing the videotaping methods

used in the study, a description of the Teaching Process Laboratory and its potential applications to analyzing noncategorical data, and a report on the use of videotapes to document ethnographic materials.

The analytic techniques and methods for this objective should be sufficiently developed by FY '81 to make a preliminary report on the microanalysis of the teacher and student behavior in the reading groups. No further work is planned in this area during FY '82. Instead, the results will be incorporated into the final reports for Objectives 2 and 3.

Objective 2: Comparison and Description of Information Gained Through Different Perspectives of the Classroom Environment

Problem. Any single method of measuring classroom process is limited by its scope, bias, and inherent unreliability. The result is that only those processes built into the methodology are detected, thus making potentially important information unavailable for analysis and risking distorting the information that is obtained. If research findings are to be applicable to educating teachers then the classroom processes must be accurately and completely represented.

Contributions. The second grade reading study currently underway has built into it a number of different perspectives of the classroom environment. By comparing these perspectives it will be possible to see where they agree, where they disagree, and what unique information each provides. This will not only contribute to a more complete understanding of the classroom but also will help other researchers who wish to use these methods to gain more information for their data.

Questions to be addressed. There are a number of questions which arise naturally from this objective. The most immediate is how does

the information gained from an ethnographic observation differ from that obtained through a categorical observation method. Teacher and student perspectives were also obtained in this study. It is of great interest how these perspectives agree and disagree and how they compare to the other possible perspectives. Finally, it will be possible to analyze how the perspectives of reading instruction differ across the four different studies of reading available to DCI.

Procedure for Objective 2: Comparison and Description of Information Gained Through Different Perspectives of the Classroom Environment

Scientific work. Various theories have been proposed to explain what happens during classroom instruction. To test these theories, observation systems that sample the relevant variables have been used to predict how much achievement gain was associated with each instructional method. While some variables have been consistently associated with achievement gain, the most likely conclusion to draw from these studies is that the behaviors tapped to date are insufficient to explain what is going on. This observation is corroborated by the recent interest in ethnomethodology which samples all events considered important by trained observers, and by the tendency to develop more and more complex observation systems. The prior work of the Evaluation of Teaching program at the Center, which concentrated on studying the reliability and validity of various observation systems, will be invaluable in developing methods to compare the information from the various observation techniques used in the second grade reading study.

Plans for data acquisition, instrumentation, and analysis. All of the data necessary for this objective will have been obtained by the end of FY '79.

Since a major goal of this study was to compare various observation methodologies, much of the early effort will be devoted to putting the various sources of data into forms that can be compared. While the SRI system has been used in several process-product studies, such as Follow-Through, no standardized system for coding it has been developed. The coding of ethnographic records is even less standardized. During FY '80, the project will develop and report on coding systems for both SRI and ethnographic records. These will be based both on the work already done by other researchers and on the psychometric properties of the data from the DCI studies.

In the final year of the study, FY '82, the basic conclusion will be presented in two reports. The first will be a detailed comparison of ethnographic versus systematic observation and what the overlaps and uniqueness of each system are. A second, smaller report will compare information that can be coded from videotapes with information from a coder present in the classroom when the videotapes were made.

Objective 3: To Understand the Dynamics of and Relevant Variables for Elementary Reading Instruction and to Provide Research Based Recommendations for the Teaching of Reading

Problem. The long history in American schools of many children failing to learn to read well indicates that there are very real problems associated with teaching reading. Unfortunately, much of the teacher effectiveness research in elementary reading instruction has been content free--it has concentrated on the teacher and student processes as if these were independent of the subject matter being taught.

Three major approaches to the teaching of reading can be discerned. These are the analytic approach as typified by the whole word method, the synthetic approach as typified by the phonics methods, and an eclectic approach that is based on a combination of whole word and phonic methods. None of these methods have shown a consistent superiority with all students so that their use has tended to follow cyclic trends of both long and short term duration. Such changes are based mainly on political and philosophical considerations and vary rarely on scientific ones.

Contributions. The failure to find a single, best method of reading instruction strongly implies that individual differences may be an important factor in which approach works best. By collecting data on both teacher process and student characteristics and perceptions the DCI project now has the necessary information to start looking at possible interaction between content, process, and student differences.

Questions to be addressed. A crucial question is whether the instructional approach should be tailored for each individual student and whether the variables needed for this tailoring can be identified and measured. This question can be further subdivided into the specific content the teacher provides for each student and how the teacher interacts with that student. A corollary issue is the extent to which the student shapes the teacher's behavior and content presented; that is, how do teachers' teaching methods interact with what students are doing, how faithfully do teachers adhere to the method of instruction they intended to use, and finally, are there differences in student progress that can be attributed to different instructional methods.

Procedures for Objective 3: To Understand the Dynamics of and Relevant Variables for Elementary Reading Instruction and to Provide Research Based Recommendations for the Teaching of Reading

Scientific work. To meet this objective it will be necessary to provide as full as possible a description of what went on in the reading classes studied, to relate this to the success or failure of the individual students in the groups, and to relate the effective variables to the work of others studying reading. Reading is a complex process and many things are known to affect how well a child is able to read at any one time. The DCI project will concentrate on those aspects of reading instruction that involve small group methods and are under the control of the teacher.

Method for accomplishment. The FY '79 second grade reading group study provided a wealth of information on the classes studied. By having the three types of observation--systematic SRI coding, ethnographic reports, and videotapes--plus the various outcome measures and student and teacher perception data, it will be possible to examine what went on in "normal" teaching in much greater detail than was possible in other studies. Because many of the instruments were also used in earlier reading studies conducted by the Classroom Organization and Effective Teacher (COET) project, it will also be possible to compare these and to cross-validate the overlapping results.

Discussion of related research. Clearly, this work is based on the great body of research that has been done in the field of teacher effectiveness in the classroom, which takes the form of observing teacher behavior and then correlating this behavior with student achievement

gain or other student measures such as self-esteem. These systems are generally classified as high inference--the observer rates the teacher on the degree of a certain behavior such as warmth--or low inference--the rater indicates the presence or absence of a specific behavior such as asking questions. Each of these methods has both advantages and drawbacks, so the current reading study used both types. The DCI program has done several experimental studies of the psychometric charactersitics of rating systems which are relevant to how the SRI data will be used and may also be applied to any recording made of the ethnographic records.

In addition to the great body of literature on reading instruction, the Center, through the COET project, has data available on three other reading studies. After the initial analysis has been done on the current study, the results will be combined with those other three studies: (1) the Texas teacher effectiveness study, (2) the first grade reading group study, and (3) the third grade organization study. These studies have focused on aspects other than content, such as teacher interaction with student characteristics or organization and management variables. The DCI study adds to these studies in tapping the same areas while adding three new dimensions. The first is information on the students' perception of reading instruction and self-esteem. The second is the concentration on content variables in reading such as the teaching of phonics rather than sight words. The third new source of information is the videotapes. These tapes will allow an extensive study of specific teacher and student behaviors, including nonverbal ones.

Data acquisition and analysis. All of the data for this study will have been collected by FY '80. The ethnographic data will be in three forms: (1) narrative records made during the class, (2) summary reports made after each class, and (3) interviews with students and teachers. The SRI observers produced two types of records: (1) preamble and five-minute observation schedules which make up the SRI instrument, and (2) high inference coding every five minutes using the COS system. The teachers were observed every other week, starting two months after the school term started, giving approximately 10 observations per teacher. After the students and teachers had become adjusted to the observers, about half the classes being observed were videotaped. At least four 1 to 1-1/2 hour videotapes are available for each teacher in the study. This period corresponds to the actual length of the active period of reading instruction, which was usually done in small groups. The teachers were interviewed at the beginning and end of the study to get their impressions about methods of teaching, materials used, and evaluations of their students. All of the teachers and observers have agreed to remain available for additional information. The school districts have provided standardized achievement test data for every student in the study during the current year and have provided the previous year's achievement test data for all those individuals who were at the school then. Additional information collected on the students included the Piers-Harris Children's Self-Concept Scale, sociograms of work and social preferences, and their perceptions of their standing in reading class.

A review of the literature on both the curricular content of reading and the handling of observation data should lead to two reports

in FY '81. The first one based on a combination of our own experiences and those of others will provide guidance for using ethnomethodology in the classroom. The second report will summarize the relevant literature on the teaching of reading which applies to the observation study.

Much of the work toward this objective will be based on the ethnographic and videotape records which have already been described. As a first step in dealing with the ethnographic data, clinical description of the teaching techniques used will be made, based on an intensive reading of the narratives and impressions gleaned from the observers. These impressions, combined with the results from other research in the field, will then be used to provide an experimental workshop for the nine teachers participating in the study, using videotapes as documentary support. The teachers will be trained to observe and diagnose classroom concerns and to prescribe alternative teaching or management techniques. This workshop will be based on a report giving the project's initial findings and the teachers' reactions to these. Both of these tasks will be accomplished in FY '80.

Developing methods to deal with the student perception and student self-concept data will take most of the first year. During FY '81, this information should be in a form that can be used to best hypothesize about how student characteristics affect what is going on in the classroom. Two reports are planned on this topic: (1) a description of how the subject area of reading and certain student characteristics interact to produce success, and (2) how the method or techniques of teaching and student characteristics interact with success. To complete the work on this objective in FY '82, the project will report on how the data from the four reading studies in the Center can be synthesized into a single picture. A consequence of this synthesis and the feedback

received during the earlier workshop will be to develop an intervention study in the participating schools. This will be a two group experimental study in which some of the teachers will be taught how to use the methods found most successful in the reading group study.

Organization and management plan. The DCI project is organized around the two major activities of refining the methodology for observing classroom instruction and using these methodologies to describe the data collected in the reading group study. The director has a degree in experimental psychology and has been working in the classroom research area for several years. Other members of the staff have interest in ethnomethodology and social interaction in the classroom.

The responsibility for the analysis and synthesis of the results from the reading group study rests with Cherry Kugle. She will supervise the analysis of all data collected in this study: SRI codings, ethnographic reports, teacher interviews, student interviews, test results, and the microanalysis of videotapes. Two of the researchers directly involved in the data collection for this study will work with her. Overall management of the project and supervision of the objectives will be handled by Director Clements. His specific responsibilities will include directing the literature reviews in the areas of teacher effectiveness and reading research, working with outside consultants, developing comparative analyses involving other Center reading studies, development of the Teaching Process Laboratory, and administration of the project. To assist him in these efforts, he will have a part-time researcher who has had several years experience in literature review for the Evaluation of Teaching Program. Cynthia Gardner, who helped

plan and collect the narrative data, will be responsible for synthesis of the ethnographic data.

With the project's small staff, it is not possible to have experts available in all the areas of knowledge impacting on the objectives. Additional help is provided by outside consultants who are either retained on a continuing basis for long-term problems or brought in for short-term help on a specific problem. In the area of nonverbal behavior the project has retained Anita Woolfolk, Associate Professor of Educational Psychology at Rutgers University. Woolfolk has done extensive work in this area and helped develop the nonverbal aspects of the ethnographic observations used in the reading group study. To help integrate the content of reading instruction into the teacher effectiveness paradigm, the project has retained James Hoffman, Associate Professor of Curriculum and Instruction at The University of Texas at Austin. Dr. Hoffman's work is in the area of miscue analysis in oral reading, which will give the project input on the work being done on techniques and theories of reading instruction. Informal arrangements have been made with a number of University of Texas faculty members to assist with studies that parallel their own research interests. By working together in this way, both the DCI project and the individual faculty benefit from shared resources.

Facilities of DCI. The DCI project is an integral part of the Research and Development Center for Teacher Education at The University of Texas at Austin, and therefore has full access to all the facilities of both the Center and The University. As a part of the Center, DCI shares its work with the other projects to contribute to the knowledge base in teacher education. The Center, in turn, provides DCI with administrative

services, extra clerical support, and reproduction equipment. As a project, DCI has a library of specialized materials collected over eight years of studying classroom observation, a library of videotapes showing classroom interaction along with supporting data, and a minicomputer-based laboratory to conduct microanalysis of videotapes. As a part of The University, DCI works closely with faculty in those disciplines which relate to the project's research. In the past, these have included consultants from education, educational psychology, psychology, sociology, and computer science. Consultants from other institutions are also called upon when local expertise is insufficient. DCI plans to continue to make full use of all these facilities.

Dissemination. The audience for information about classroom process spans the full spectrum of educational practice. At one end are researchers who require highly technical information, at the other end are school teachers and administrators who require practical knowledge, and in between these two extremes are teacher educators who need to know both what the research is and how to apply it. The DCI project will disseminate products to satisfy the needs of all three audiences.

The researcher is interested in the findings of specific studies. This includes things like how a study was conducted, how the data were obtained, how the data were analyzed, and on what basis the conclusions were reached. With this information, the researcher can evaluate the merits of various studies and draw conclusions about the combined impact. The teacher educator is not as much interested in the outcome of a specific study as in the conclusions drawn about a series of studies exploring the various facets of a major concept. The teacher educator wants to know what are the variables that have an impact on the

learning process and what is the nature of this effect. Armed with this information, he or she can develop teacher training programs that take advantage of the knowledge base in classroom research. The practitioner in the schools, whether teacher or administrator, needs specific information on how to apply research findings to classroom practice. He or she also needs to know what research tools can be used for diagnosing and treating classroom problems (e.g., observation techniques, design of coding systems to target particular concerns, and methods for extrapolating from these). By adapting his or her teaching style to reflect those methods that have been found to be effective, the practitioner is able to increase the learning that takes place in the classroom and to provide an equal opportunity for all students.

Dissemination to the research community takes the form of technical reports, convention papers and articles in scholarly journals. Every study or experiment carried out by DCI is documented by at least one technical report. Those aspects that merit further dissemination are prepared as convention papers for organizations such as the American Educational Research Association or sent to appropriate journals as articles. Dissemination to the teacher educator takes the form of comprehensive reports, books, or conferences. Often this activity will be done in conjunction with other projects in the Center, especially in the case of conferences. Dissemination to the practitioner takes the form of how-to-do-it pamphlets, articles, or workshops. Because of the early stage of our work in this area, the dissemination to teachers must be limited and experimental in nature. Current plans call for giving a workshop involving the teachers who participated in the reading group study in FY '80.

The DCI project intends to disseminate its research results to as wide an audience as possible and to put those reports in various forms to satisfy the needs of the various members of the educational community. In return, the project would like to receive feedback from many viewpoints so that its research can be made responsive to today's and tomorrow's needs.

References

Anderson, L., Evertson, C., & Brophy, J. An experimental study of effective teaching in first-grade reading groups. Elementary School Journal, 1979, 79, 193-22.

Borich, G.D. Implications for developing teacher competencies from process-product research. Journal of Teacher Education, 1979, 30(1), 77-86.

Good, T. Teacher effectiveness in the elementary school. Journal of Teacher Education, 1979, 30, 52-64.

Medley, D.M. Teacher competence and teacher effectiveness: A review of process-product research. Washington, D.C.: American Association of Colleges for Teacher Education, August, 1977.

Rosenshine, B. Teaching behaviours and student achievement. London: National Foundation for Educational Research, 1971.

Tikunoff, W., Berliner, D., & Rist, R. An ethnographic study of the forty classrooms of the beginning teacher evaluation study known sample. Far West Laboratory for Educational Research and Development, 1975.

Bibliography

Borich, G.D. The appraisal of teaching: Concepts and process. Reading, Mass.: Addison-Wesley, 1977.

Borich, G.D. Building a performance appraisal system. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1976. (From The appraisal of teaching: Concepts and process, Reading, Mass.: Addison-Wesley, 1977.)

Borich, G.D. Examining research on the appraisal process. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1976. (From The appraisal of teaching: Concepts and process, Reading, Mass.: Addison-Wesley, 1977.)

Borich, G.D. Implications for developing teacher competencies from process-product studies. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1978.

Borich, G.D. Measuring teacher performance. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1976. (From The appraisal of teaching: Concepts and process, Reading, Mass.: Addison-Wesley, 1977.)

Borich, G.D. Program evaluation: New concepts, new methods. In Focus on Exceptional Children, May 1977, 9(3), 14.

Borich, G.D. A recommended procedure for identifying trait-treatment interactions with special reference to post hoc analyses. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1973.

Borich, G.D. Sources of invalidity in measuring classroom behavior. Instructional Science, 1977, 6, 283-318.

Borich, G.D. A state of the art: Assessment of educational evaluation. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1978.

Borich, G.D. Three school based models for conducting followup studies of teacher education and training. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1978.

Borich, G.D. Toward defining teacher competence. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1976. (From The appraisal of teaching: Concepts and process, Reading, Mass.: Addison-Wesley, 1977.)

Borich, G.D. Using appraisal techniques and procedures. Austin, Texas; The University of Texas Research and Development Center for Teacher Education, 1976. (From The appraisal of teaching: Concepts and process. Reading, Mass.: Addison-Wesley, 1977.)

Borich, G.D., & Godbout, R.C. The effect of two models of teacher training on pupil evaluations of their teachers as a function of the personality and attitudes of the trainee. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1976.

Borich, G.D., Godbout, R.C., & Wunderlich, K.W. The analysis of aptitude-treatment interactions: Computer programs and calculations. Chicago: Internation Educational Services, 1976.

Borich, G.D., Godbout, R.C., & Marston, P.T. Index for determining the importance of a region of significance and some applications to published ATI research. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1976.

Borich, G.D., & Madden, S.K. Evaluating classroom instruction: A source-book of instruments. Reading, Mass.: Addison-Wesley, 1977.

Borich, G.D., Malitz, D., & Kugle, C. Convergent and discriminant validity of five classroom observation systems: Testing a model. Journal of Educational Psychology, 1978, 70(2), 119-128.

Borich, G.D., Malitz, D., Kugle, C.L., & Pascone, M. Convergent and discriminant validity of five classroom observation systems: Testing the model. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1977.

Borich, G.D., & Paver, S. Convergent and discriminant validity of the locus of control construct. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1978.

Borich, G.D., & Peck, R.F. Relationship between teachers' marks, achievement test scores and aptitude as a function of grade, ethnicity and sex. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1976.

Calkins, D.S., Borich, G.D., Pascone, M., & Kugle, C.L. Generalizability of teacher behaviors across classroom observation systems. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1977.

Calkins, D.S., Clements, R.O., Kugle, C.L., & Malitz, D. Development of a competency based professional personnel evaluation system: A cooperative effort between an R&D center and school system. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1978.

Calkins, D., Erlich, O., Marston, P., & Malitz, D. An empirical investigation of the distributions of generalizability coefficients and variance estimates for an application of generalizability theory. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1978.

Calkins, D.S., Godbout, R.C., Poynor, L.H., & Kugle, C.L. Relationships between pupil achievement and characteristics of observed teacher behavior distributions. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1976.

Clements, R.O., Malitz, D., & Zimmerer, L.K. The effects of situational bias on coding performance. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1979.

Clements, R., Zimmerer, L., & Kash, M. The effects of prior opinion on coding teacher behavior. Austin, Texas: The Research and Development Center for Teacher Education, 1978.

Erlich, O., & Borich, G. Factorial analysis of generalizability. Educational and Psychological Measurement, 1978, 38(1), 125-133.

Erlich, O., & Borich, G.D. Generalizability of teacher process behaviors during reading instruction. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1976.

Erlich, O., & Borich, G.D. Measuring classroom interactions: How many occasions are required to measure them reliably? Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1976.

Erlich, O., & Borich, G. Occurrence and generalizability of scores on a classroom interaction instrument. Journal of Educational Measurement, in press, 1978.

Godbout, R.C., Marston, P.T., & Vaughan, C. The problem of spurious significance in educational research. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1976.

Johnson, N.K., & Gardner, C.H. Toward a prototype for training classroom ethnographers. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1979.

Kash, M.M., Borich, G.D., & Fenton, K.S. Teacher behavior and pupil self-concept. Reading, Mass.: Addison-Wesley, 1978.

Kugle, C.L. A potential source of bias in classroom observation systems: Coder drift Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1978.

Kugle, C.L. Data collection procedures for the evaluation of teaching program, Phase II. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1978.

Kugle, C.L., & Calkins, D.S. The effect of considering student opportunity to learn in teacher behavior. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1976.

Kugle, C.L., & Zimmerer, L.K. Data collection procedures for coder drift studies. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1978.

Malitz, D. Identification of predictors of coding performance: Selecting subjects to be trained to use observation systmes. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1978.

Malitz, D., Clements, R.O., & Zimmerer, L.K. Selecting subjects to be trained to use observational systems: A replication and extension. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1978.

Marston, P.T. A simulation study of four methods used to analyze change. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1978.

Marston, P.T., & Borich, G.D. Analysis of covariance: Is it the appropriate model to study change? Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1977.

Marston, P.T., & Clements, R.O. Measuring attitudes that bias teacher observation. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1979.

Marston, P.T., Kugle, C.L., & Zimmerer, L.K. Coder drift: A reliability problem for teacher observations. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1978.

Marston, P.T., & Zimmerer, L.K. The effect of using more than one type of teacher observation system in the same study. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1979.

Poynor, L.H., Calkins, D.S., & Kugle, C.L. An investigation of the effects of classroom contextual variables in analyses of relationships between teacher behaviors and pupil achievement. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1976.

Poynor, L.H., & Wetherold, R. Instrumentation for the evaluation of teaching project. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1976.

Wetherold, R., & Poynor, L.H. Data collection procedures for the evaluation of teaching project. Austin, Texas: The University of Texas Research and Development Center for Teacher Education, 1976.